

WHAT IS CLAIMED IS:

1. A breathing arrangement for use between a patient and a structure to deliver a breathable gas to the patient, the breathing arrangement comprising:

a patient interface including

a mouth covering assembly including a cushion (42) structured to sealingly engage around an exterior of a patient's mouth in use,

a nozzle assembly including a pair of nozzles (17) structured to sealingly engage within nasal passages of a patient's nose in use, and

a flexible element (19, 41, 43, 45, 47, 90) connecting the mouth covering assembly and the nozzle assembly;

at least one inlet conduit (22, 35) structured to deliver breathable gas into at least one of the mouth covering assembly and the nozzle assembly for breathing by the patient; and

a headgear assembly (1, 31, 80, 160, 170, 190, 210) removably connected to at least one of the mouth covering assembly and the nozzle assembly so as to maintain the mouth covering assembly and the nozzle assembly in a desired position on the patient's face.

2. The breathing arrangement according to claim 1, wherein the mouth covering assembly provides a first chamber (14) and the nozzle assembly provides a second chamber (12).

3. The breathing arrangement according to claim 2, wherein the flexible element (19, 41, 43, 45, 47, 90) includes a conduit that allows gas to pass between the first and second chambers (14, 12).

4. The breathing arrangement according to any one of claims 1-3, wherein the nozzle assembly is adapted to connect to an inlet conduit (22, 35) to deliver breathable gas to the patient's nose.

5. The breathing arrangement according to any one of claims 1-4, wherein the mouth covering assembly is adapted to connect to an inlet conduit (22, 35) to deliver breathable gas to the patient's mouth.

6. The breathing arrangement according to claim 1, wherein the mouth covering assembly and the nozzle assembly form a single chamber (40).

7. The breathing arrangement according to any one of claims 1-6, wherein the cushion (42), nozzles (17), and flexible element (19, 41, 43, 45, 47, 90) are integrally formed as a one-piece structure.

8. The breathing arrangement according to any one of claims 1-7, wherein the cushion (42) includes a non-face-contacting portion and a face-contacting portion, the non-face-contacting portion being structured to be removably attached to a substantially rigid frame (38) and the face-contacting portion having a resilient membrane (58) structured to provide a seal.

9. The breathing arrangement according to claim 8, wherein the cushion (42) includes a gusset portion (62) between the non-face-contacting portion and the face-contacting portion.

10. The breathing arrangement according to any one of claims 8-9, wherein the cushion (42) has a side wall (51), a rim (53) extending away from the side wall (51), and a membrane (58) that substantially surrounds the rim (53).

11. The breathing arrangement according to claim 10, wherein the nozzles (17) are mounted upon the side wall (51).

12. The breathing arrangement according to claim 11, wherein the nozzles (17) are angled with respect to the side wall (51).

13. The breathing arrangement according to any one of claims 8-12, wherein an inner edge of the membrane (58) defines an aperture (55), the aperture (55) having a general oval shape.

14. The breathing arrangement according to claim 13, wherein the aperture (55) includes an arcuate protruding portion along an upper and/or lower edge thereof.

15. The breathing arrangement according to claim 10, wherein a rim (53) is provided on lateral sides of the side wall (51).

16. The breathing arrangement according to any one of claims 8-15, wherein the membrane (58) has a thickness that is less than a thickness of the rim (53).

17. The breathing arrangement according to any one of claims 1-16, wherein the headgear assembly (1, 31, 80, 160, 170, 190, 210, 230) includes a strap (30, 74, 76, 78, 82, 161, 171, 191, 211, 232) routed around the top of the patient's ears.

18. The breathing arrangement according to any one of claims 1-17, wherein the headgear assembly (1, 31, 80, 160, 170, 190, 210) may be rotated with respect to the patient interface so as to adjust a position of the headgear assembly (1, 31, 80, 160, 170, 190, 210) with respect to the patient interface in use, without detaching the headgear assembly (1, 31, 80, 160, 170, 190, 210) and the patient interface.

19. The breathing arrangement according to any one of claims 1-18, wherein the headgear assembly (1, 31, 80, 160, 170, 190, 210) is connected to the patient interface with a snap-fit.

20. The breathing arrangement according to any one of claims 1-19, wherein the patient interface includes a frame (38), the frame (38) including an inlet conduit (22, 35) coupled to one side thereof and an anti-asphyxia valve module (150) coupled to an opposite side thereof.

21. The breathing arrangement according to any one of claims 1-20, wherein the nozzles (17) are blocked from fluid communication with the cushion (42).

22. The breathing arrangement according to any one of claims 1-21, wherein the cushion (42) and nozzles (17) are formed from one of a gel-like material or foam-like material.

23. The breathing arrangement according to any one of claims 1-22, wherein the nozzles (17) are formed separately from the cushion (42) and selectively mounted thereto.

24. The breathing arrangement according to any one of claims 1-23, wherein the patient interface includes a frame (38), the frame (38) having corrugations that add flexibility to the frame (38).

25. The breathing arrangement according to any one of claims 1-24, wherein each nozzle (17) includes a conduit (19) having a concertina configuration that adds flexibility to the nozzle (17).

26. The breathing arrangement according to any one of claims 1-25, wherein the nozzles (17) are mounted within rounded recesses (120) to add flexibility to the nozzles (17).

27. The breathing arrangement according to any one of claims 1-26, wherein each nozzles (17) includes a conduit (19) having a varying cross-sectional configuration.

28. The breathing arrangement according to any one of claims 1-27, wherein each nozzle (17) includes a gusset portion (29) that changes the sealing force in accordance with the treatment pressure.

29. The breathing arrangement according to any one of claims 1-28, wherein each nozzle (17) includes a thin membrane (124) that surrounds each nozzle (17).

30. The breathing arrangement according to any one of claims 1-29, further comprising a nozzle support member (130, 134, 140) that engages the nozzles (17) to support the nozzles (17) in a rigid configuration for alignment.

31. The breathing arrangement according to any one of claims 1-30, wherein the cushion (42) has a boomerang shape (Fig. 63).

32. A breathing arrangement for use between a patient and a structure to deliver a breathable gas to the patient, the breathing arrangement comprising:

a mouth appliance (110) including

a soft seal (114) abutable against the inner surface of the patient's mouth, and

a snap flap (116) abutable against the outer surface of the patient's mouth; and

a pair of nozzles (17) structured to sealingly engage within nasal passages of a patient's nose in use, the nozzles (17) being mounted to the mouth appliance (110) by a conduit (19) that allows gas to pass between the mouth appliance (110) and the nozzles (17).

33. The breathing arrangement according to claim 32, wherein the mouth appliance (110) includes a tongue depressor (112) engagable with the patient's tongue.

34. A breathing arrangement for use between a patient and a structure to deliver a breathable gas to the patient, the breathing arrangement comprising:

a frame (38) having a main body and a side frame member provided on each lateral side of the main body;

the main body providing an aperture therethrough for the introduction of breathable gas in a breathing cavity;

each side frame member including at least one male connector (165a, 165b, 174a, 174b, 194, 214, 238a, 238b) extending therefrom;

an inlet conduit (22) coupled to the aperture for delivering breathable gas into the breathing cavity; and

a headgear assembly (160, 170, 190, 210, 230) including at least one strap (161, 162, 171, 172, 191, 192, 211, 212, 232, 234) wherein each end of the strap (161, 162, 171, 172, 191, 192, 211, 212, 232, 234) has a female connector (164, 173a, 173b, 193, 213, 236) coupled thereto, each female connector (164, 173a, 173b, 193, 213, 236) configured to receive a respective male connector (165a, 165b, 174a, 174b, 194, 214, 238) to interlock the headgear assembly (160, 170, 190, 210, 230) with the frame (38).

35. The breathing arrangement according to claim 34, wherein each side frame member includes upper and lower male connectors (165a, 165b, 174a, 174b, 238a, 238b).

36. The breathing arrangement according to any one of claims 34-35, wherein the headgear assembly includes upper and lower straps (161, 162, 171, 172, 191, 192, 211, 212, 232, 234).

37. The breathing arrangement according to any one of claims 34-36, wherein each female connector (164, 193, 213, 236) includes a relatively large lead-in opening (168a) that leads into a relatively smaller attachment opening (168b, 196, 218).

38. A patient interface for a breathing arrangement that delivers breathable gas to a patient, the patient interface comprising:

a cushion (42) structured to sealingly engage around an exterior of a patient's mouth in use, the cushion (42) including

a side wall (51) structured to be removably attached to a frame (38),

a rim (53) extending away from the side wall (51), and

a membrane (58) provided to substantially surround the rim (53); and

a pair of nozzles (17) structured to sealingly engage within nasal passages of a patient's nose in use, each of nozzles (17) including a conduit (19) that supports each nozzle (17) on the side wall (51) of the cushion (42),

wherein the conduit (19) allows gas to pass between each of the nozzles (17) and the cushion (42).

39. The patient interface according to claim 38, wherein the membrane (58) has a substantially flat profile.

40. The patient interface according to any one of claims 38-39, wherein the inner edge of the membrane (58) defines an aperture (55) having a generally oval shape.



41. The patient interface according to claim 40, wherein the upper and/or lower edge of the aperture (55) includes an arcuate protruding portion.

42. The patient interface according to any one of claims 38-41, wherein the side wall (51) supporting the nozzles (17) includes an arcuate configuration.

43. The patient interface according to any one of claims 38-42, wherein the rim (53) is provided on lateral sides of the side wall (51) only.

44. The patient interface according to any one of claims 38-43, wherein the nozzles (17) are angled with respect to the side wall (51).

45. The patient interface according to any one of claims 38-44, wherein the side wall (51) includes a gusset portion (62).

46. A breathing arrangement that delivers breathable gas to a patient, the breathing arrangement comprising:

a substantially rigid frame (38); and

a patient interface including

a cushion (42) structured to sealingly engage around an exterior of a patient's mouth in use, the cushion (42) including

a side wall (51) structured to be removably attached to the frame (38),

a rim (53) extending away from the side wall (51), and

a membrane (58) provided to substantially surround the rim (53); and

a pair of nozzles (17) structured to sealingly engage within nasal passages of a patient's nose in use, each of nozzles (17) including a conduit (19) that supports each nozzle (17) on the side wall (51) of the cushion (42);

wherein the conduit (19) allows gas to pass between each of the nozzles (17) and the cushion (42).

47. The breathing arrangement according to claim 46, wherein the membrane (58) has a substantially flat profile.

48. The breathing arrangement according to any one of claims 46-47, wherein the inner edge of the membrane (58) defines an aperture (55) having a generally oval shape.

49. The breathing arrangement according to claim 48, wherein the upper and/or lower edge of the aperture (55) includes an arcuate protruding portion.

50. The breathing arrangement according to any one of claims 46-49, wherein the side wall (51) supporting the nozzles (17) includes an arcuate configuration.

51. The breathing arrangement according to any one of claims 46-50, wherein the rim (53) is provided on lateral sides of the side wall (51) only.

52. The breathing arrangement according to any one of claims 46-51, wherein the nozzles (17) are angled with respect to the side wall (51).

53. The patient interface according to any one of claims 46-52, wherein the side wall (51) includes a gusset portion (62).

54. The breathing arrangement according to any one of claims 46-53, wherein the frame (38) is adapted to connect to an inlet conduit (22) for delivering breathable gas.